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passes it. In fact, I have never seen anything outside the tropics which, in my opinion, would compare with the large masses of deep scarlet berries displayed by *P. arbutifolia.* The species was not abundant, but was noticed in several places, growing usually in clefts of rocks, and forming a tall shrub of 5–10 feet in height. It was observed in cultivation at two places along the road leading to the Point, in one instance forming a tree some 20 feet high. Another peculiarity of the vegetation of the Point which Mr. Britton omits to mention is the remarkable form assumed by the few hemlock-trees which grow there. One was noticed which had an elevation of not more than six feet, but which expanded a rod or more (I write from memory, no measurements having been taken), the dense flat top supported on a comparatively massive straight trunk a foot or more in diameter and several feet in height. I was told of a tree (said to be a pine), of similar shape, growing at the mouth of the "ice cave" which expanded more than 30 feet, although no taller than the one just described.

Robert Ridgway.

Teratological Notes.—In the Bulletin of July, last year, I recorded the fruiting in my garden of an *Arisæma triphyllum* with twin spadices. I have this last summer received from my brother, Professor L. W. Bailey of Fredericton, New Brunswick, Canada, who was ignorant of my previous observation, a specimen in the same condition. The flowering portion is simple, and so is the constricted neck, but above, the club-shaped appendages are distinct. Of these, one is taller than the other. The discoverer does not indicate any change in the surrounding spathe.

I have an English walnut with three cotyledons. This reminds me to say that after sending my note on *Ipomœa* (present volume, page 82), I found one in my yard with three perfect cotyledons.

W. W. Bailey.

Botanical Notes.

The Flora of the Country Bordering the Rio Grande, in Chihuahua and Texas.—In a paper read before the New York Academy of of Sciences. Dr. Newberry says:

The country bordering the Rio Grande, in Chihuahua and Texas, is nearly destitute of trees, a feature which marks the aridity of the climate; yet, in certain localities, as on the bottom lands of the Rio Grande and Rio Concho, a vigorous and somewhat varied forest-growth was found at the advent of the whites. No better illustration of the relation between the kind of vegetation and the water supply in a country can be found than that afforded by the luxuriant growth of trees of several kinds along the Cibola in the Chinati Mountains, Texas; while on all sides this oasis is surrounded by an apparently boundless grass-covered prairie, where the rain-fall is inadequate for trees. On the mountain-summits, south of the Rio Grande is a sparse growth of piñon (*Pinus edulis*) and evergreen oak (*Quercus Emoryi.*) The lowlands in certain localities, over thousands of acres, are thickly set with mesquite (*Prosopis glandulosa*), here a strong, spreading shrub, never a tree, but with roots disproportionately large, composed of very dense tissue and furnishing a large amount of excellent fuel. Along the arroyos, cottonwood may occasionally be seen, either the narrow- or the broad-leaved form (*Populus monilifera* or *P. angustifolia*), and more commonly the hackberry (*Celtis occidentalis*), and the nopal, the little black walnut (*Juglans rupestris*), the Mexican buckeye (*Ungnadia speciosa*), and the guayacan (*Guaiacum Coulteri*). The drier portions, especially the gravel terraces bordering the Rio Grande, are frequently covered with the creosote-plant (*Larrea Mexicana*) and *Fouquiera splendens.* The latter forms a cluster of fifteen or twenty canes, ten or twelve feet high, springing from the same root and bristling with spines an inch or more in length, of which the bases are in contact. Usually it is without leaves, and seems as though dead; but, for a brief interval in the rainy season, it is covered with small, crowded, obovate leaves, and from the summits of each stem springs one or more spikes of brilliant crimson flowers.

Among the shrubs which form the "chaparral" or thickets, the *Holacantha* is the most conspicuous, and *Salazaria* the most interesting. The former, as its name implies, is a mass of thorns, which are often as large and strong as those of the honey-locust. The branches and spines are covered with a green epidermis, which performs the functions of leaves, and, in the spring, these bear bunches of yellow flowers similar to those of *Berberis*. The *Salazaria* is a labiate allied to *Scutellaria*, and the seed is inclosed in a balloon-like capsule, similar to that of the balloon-vine (*Cardiospermum*), also found here, and having the same function, namely, dissemination by the wind. Two species of *Acacia* and one of *Berberis* (*B. trifoliata*), all spiny, help to make the chaparral as nearly impenetrable as the thickets of cactus further west. We are here fairly within the confines of the cactus country, but not in its heart. Many species differing much in habit are constantly in sight—the "nopal," an *Opuntia*, being the most common, one species growing in a mass ten feet or more in height, with each leaf-like subdivision of the stem a foot in diameter. Though covered with spines, this plant is largely eaten by cattle, and nothing is more common than to see a patch of it trampled down, half eaten, and the flattened stems notched by semicircular bites. One species or variety of *Opuntia*, growing abundantly in Chihuahua, is of a deep purple color, which makes it conspicuous and often ornamental.

The most striking feature in the botany of this region is formed by the century-plant and its allies, other species of *Agave*, *Habranthus* and *Dasylirion*, and the yuccas. In many places these are the only plants attaining any large size, and are very numerous, scattered over the plains and slopes of the mountains; the plants not crowded, but separated by intervals of a few feet, which are occupied with a luxuriant growth of gramma grass. The yuccas belong to four species, or three species and two varieties, *Yucca angustifolia* and *Y. baccata.* Of these, two rise to the height of five to fifteen feet, with trunks from six to twelve inches in diameter, the crowded, radiating leaves crowning the summit in a round or oval mass, six feet or more in diameter, the old leaves hanging perpendicularly and forming a peculiar thatch around the trunk and extending to the ground.

The century-plant is in Chihuahua represented by a variety with shorter and broader leaves than that commonly cultivated. From the centre of the tuft, the flower-stalk rises from 10 to 25 feet in height, composed of woody tissue and standing some years after bearing flowers. These persistent flower-stalks, crowning the ridges and visible for miles, give a peculiar aspect to the scenery. The century-plants are, however, nowhere as numerous as the species of *Dasylirion*, with which they are associated, and which do not die with the effort of florescence. Further south, the agave supplies from its sweet juice the material from which an intoxicating drink is produced. In this region, however, an alcoholic beverage is obtained from the "sotol" (*Dasylirion Texanum*), which, from its abundance and the use made of it, deserves a prominent place among the economical plants of the country. Hundreds of thousands of acres are covered with this sotal, and it would seem that it might be much more largely utilized than it is for the manufacture of alcohol. The leaves are three to three and a half feet long by one a half inches wide at the base, straight, flat, and garnished on either side with strong recurved hooks. The color is yellow-green, and the leaves are very numerous. From the centre rises, at a certain stage of growth, a woody flower-stalk, ten feet high and at the base as large as one's arm. The trunk rises but a few inches above the ground and is completely concealed. The top of this trunk, composed of the closely imbricated leaf-bases, which are broad, yellow, shining, succulent and sweet, with a pulpy mass at the centre, containing much saccharine matter, raw, or better roasted, is palatable and nutritious; so much so, that in the country where it grows it is said the Indians never really suffer for want of food, as this affords them an abundant if not varied aliment.

In the preparation of sotol whisky—a liquid called *mescal*, as is also that made further west from other plants—the portion of the plant which has been described is trimmed so as to resemble a head of cabbage, then roasted and fermented, the product of the vinous fermentation being distilled in the ordinary way. For roasting the sotol, a pit is dug, some ten feet in diameter and four feet deep, lined with rude masonry. In this a fire is built, and when it has been burned down, the pit is filled with several hundred sotol heads. When roasted, they are chopped in pieces and fermented in vats.

Another interesting plant, the companion of the sotol, is the "lechuguilla" (*Agave heterocantha*), of which the leaves furnish a strong fibre, universally employed for ropes, sacks, etc., in Northern Mexico. This grows on the mountain slopes, generally at an elevation of about 4,000 to 5,000 feet, is common in all Northern Chihuahua, and especially abundant on the Chinati Mountains in Texas.

The Syracuse Botanical Club.—We are informed that, owing to ill health, Mrs. Grifford has been obliged to resign the position of Corresponding Secretary of the Syracuse Botanical Club, and that Mrs. S. M. Rush has been elected to fill the vacancy.